6-17-2015

Barriers and Opportunities to Promote Rights to Sustainable Production of Smallholders in the Context of Climate Stresses in Central America

Raffaele Vignola
CATIE

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The Right to Food
University of Vermont
June 2015

RAFFAELE VIGNOLA, PhD.

LATIN AMERICAN CHAIR ON ENVIRONMENTAL DECISIONS FOR GLOBAL CHANGE

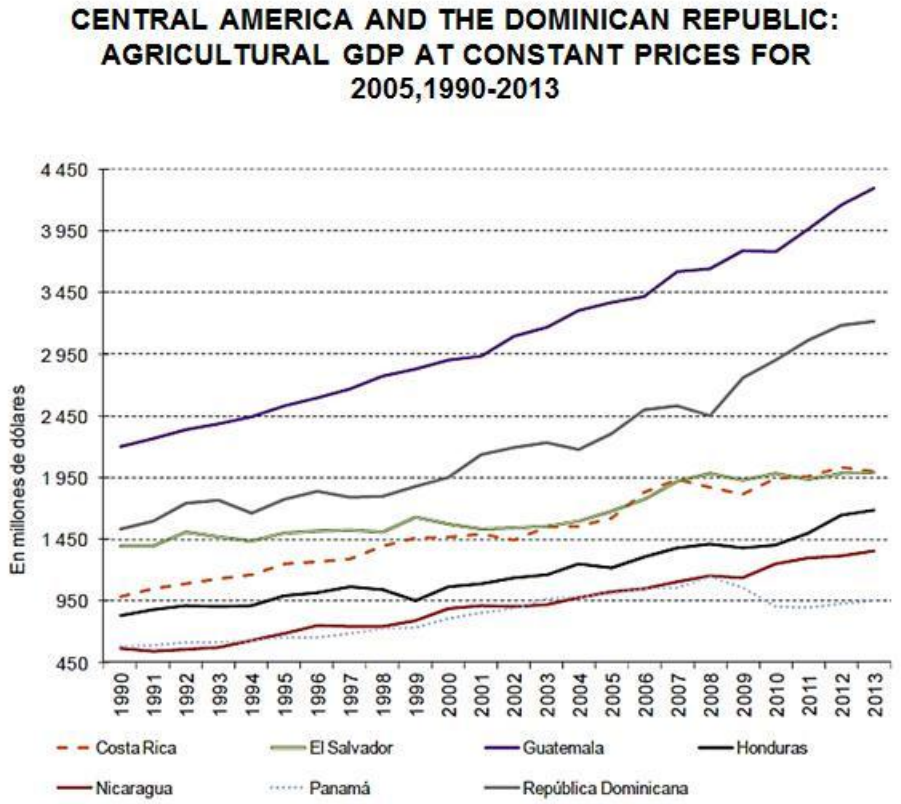
PROGRAM ON CLIMATE CHANGE AND WATERSHEDS

CATIE, COSTA RICA

WITH INPUTS FROM CASCADA PROJECT KARINA POVEDA, PAVEL BAUTISTA, PAVEL RIVERA, MARCO OTAROLA, CELIA HARVEY, JACQUES AVELINO, BRUNO RAPIDEL, RUTH MARTINEZ.

Central America Context

- Agricultural sector absorbs more than half of rural workers in the region (54.1%) (FAO, 2007).



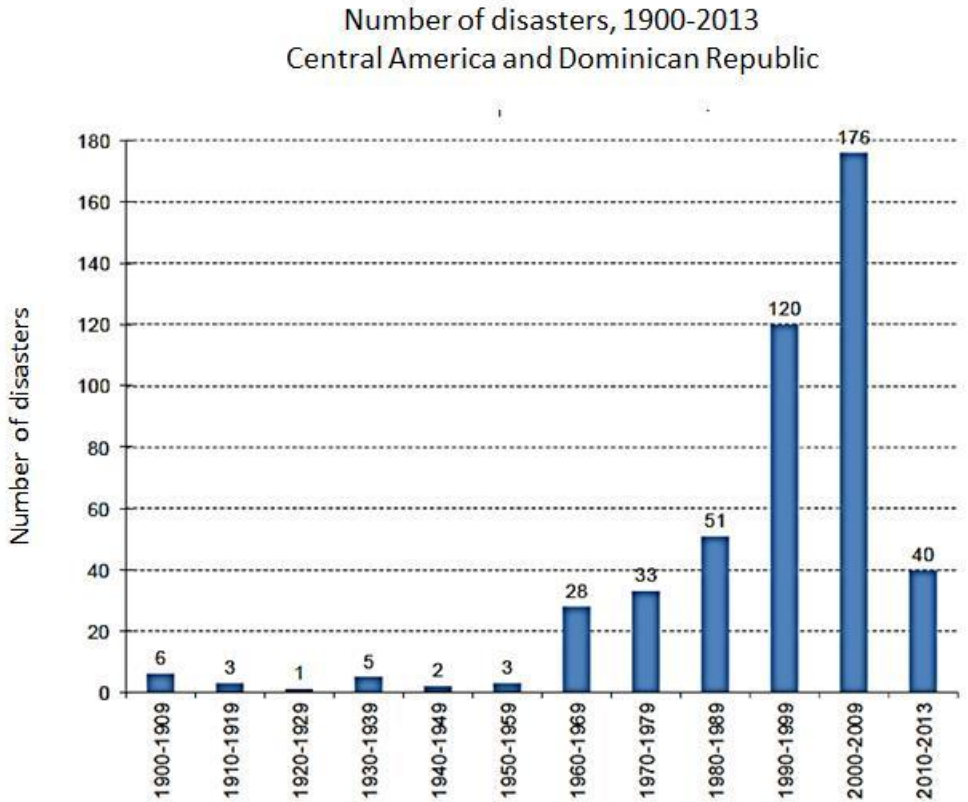
CEPAL, 2015

Central America agriculture vulnerability to climate stresses

Historically exposed to extreme weather events. (in 1900-2013, 311 hydrometeorological disasters (EM-DAT, 2013).

Projections picture a worsening context (T°C increase 1.6 to 4, Rainfall -22% to +7% in 2100) but real threat is variability: frequency, intensity, spatial extent and duration of extreme events (IPCC 5th AR, 2014)

Honduras and Nicaragua are located at position 1 and 2 of Global Climate Risk Index including both the economic and social impacts (Harmeling, 2007) .



Central America agriculture vulnerability to climate stresses and growing responses

Most culturally or economically important crops for smallholders (beans, maize, rice coffee) will be significantly affected (IDB,2012)

Sums with low incomes, fewer options to pursue other livelihoods, low institutional support (IDB,2012)

Responses go from:

1) leaving producers at their destiny: National or International migration, deepening poverty condition

2) increasing government support and promoting transformation (e.g. public initiatives in Costa Rica being globally first in agrochemical use promoting Organic Law, Sustainable Gastronomy, bottom-up The Peasant-To-Peasant movement in Nicaragua and Guatemala, etc.)

Sustainable Production in Central America

223 417 hectares certified plus 29,905 farms in transition to organic (IICA, 2014).

Most are smallholders organized in cooperatives and associations usually accessing market through intermediaries (IICA, 2009).

- Coffee, cocoa and bananas are the main certified organic crops in these countries. Other important crops were pineapple, sugar cane, sesame and the cashew nut (CIAO,2014)
- Lack of linkage with the local market (Umaña, 2009).

Sustainable agriculture practices promising for EbA in smallholders' farming

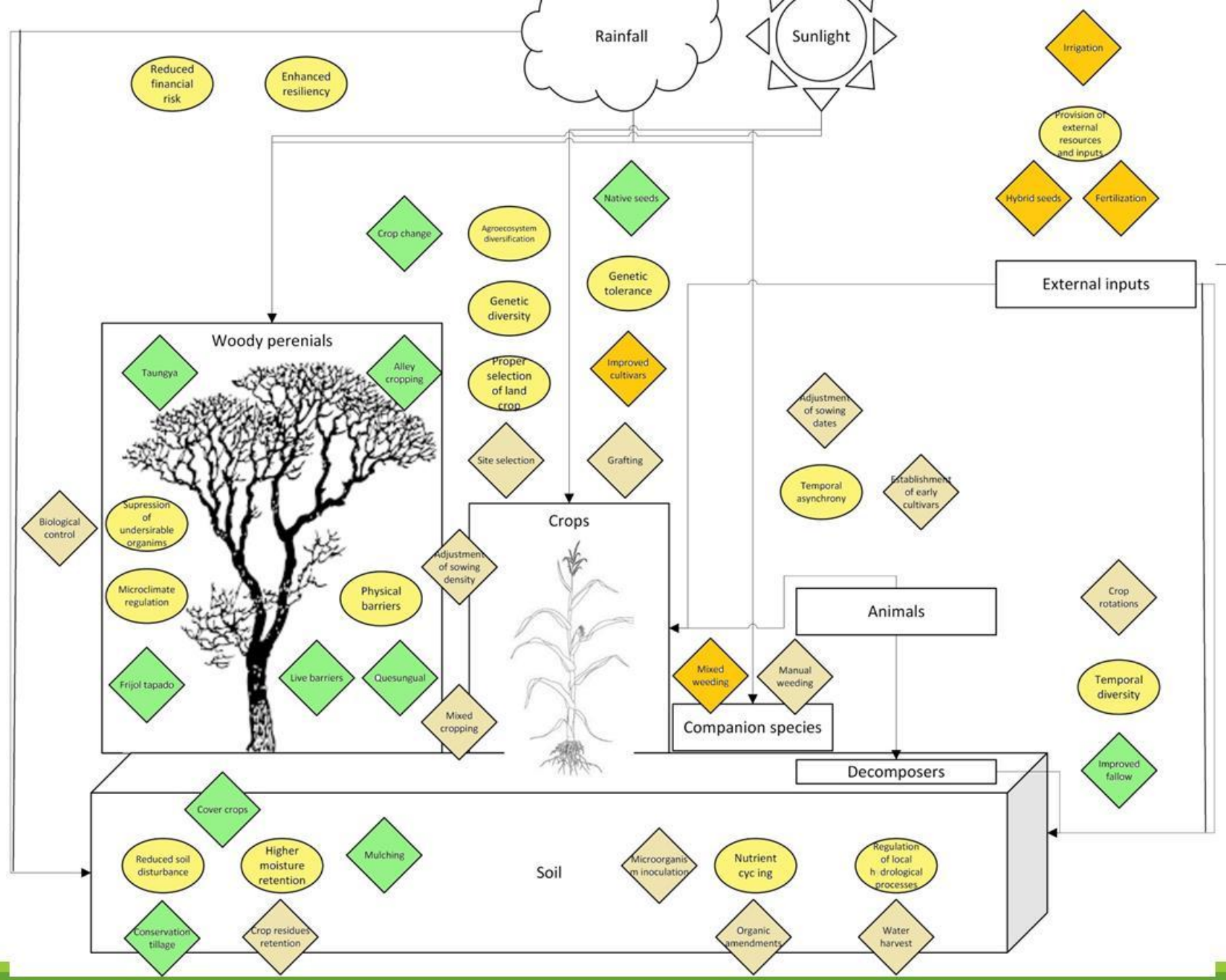
Ecosystem-based Adaptation (EbA) integrates the use of biodiversity and ecosystem services into an overall strategy to help smallholders cope with and recover from the adverse impacts of climate change and variability (Vignola et al 2015 in Press).

Dimension 1: Ecosystem-based	Dimension 2: Adaptation benefits	Dimension 3: Livelihood security
• Is based on the conservation, restoration and sustainable management of biodiversity AND ecological functions and processes (such as nutrient cycling, soil formation, water infiltration, carbon sequestration, etc.)	• Maintains or improves crop, animal or farm productivity in face of climate variability and climate change (mitigates impacts of extreme weather events and associated pests and diseases	• Increases food security of smallholder households • Takes advantage of local or traditional knowledge of smallholder farmers • Uses local, available and renewable inputs • Requires implementation costs and labor affordable to smallholder farmers

Practices have been proven to help smallholders face extreme weather events

A systematic review of 326 documents regarding practices for coffee (23), corn (22) and beans (16) (key crops for smallholders in Central America)

Eliciting opinion of 75 experts from 3 Countries and 6 landscapes on benefits and barriers to adoption of sustainable practices



Conceptual scheme of bio-physical mechanisms of farm-climate interaction

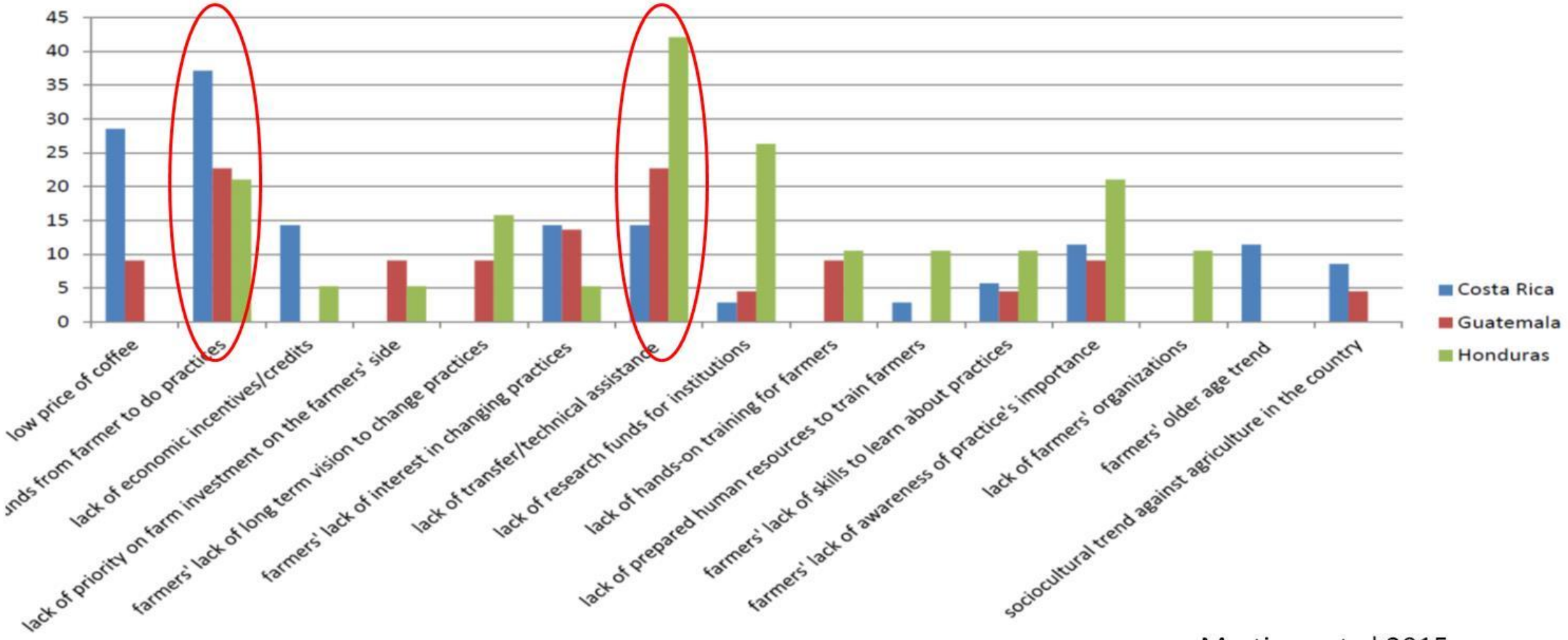
EbA VS conventional management: highlights from coffee experts

Feature	EbA	Conventional
Practice	**Shade-grown**	**Unshaded**
Pest control	Use natural processes	Agrochemical control
Coffee quality	High	Regular
Yield and farming system benefits	Fruits, firewood, wood, carbon sequestration, spices, nutrient cycles, ecotourism, possible lower coffee yield	Higher Coffee yields
Labour	Higher	Lower
Investment	High but adaptable	High but adaptations impact yield
Market	Gourmet	Regular

Shaded coffee adaptation benefits

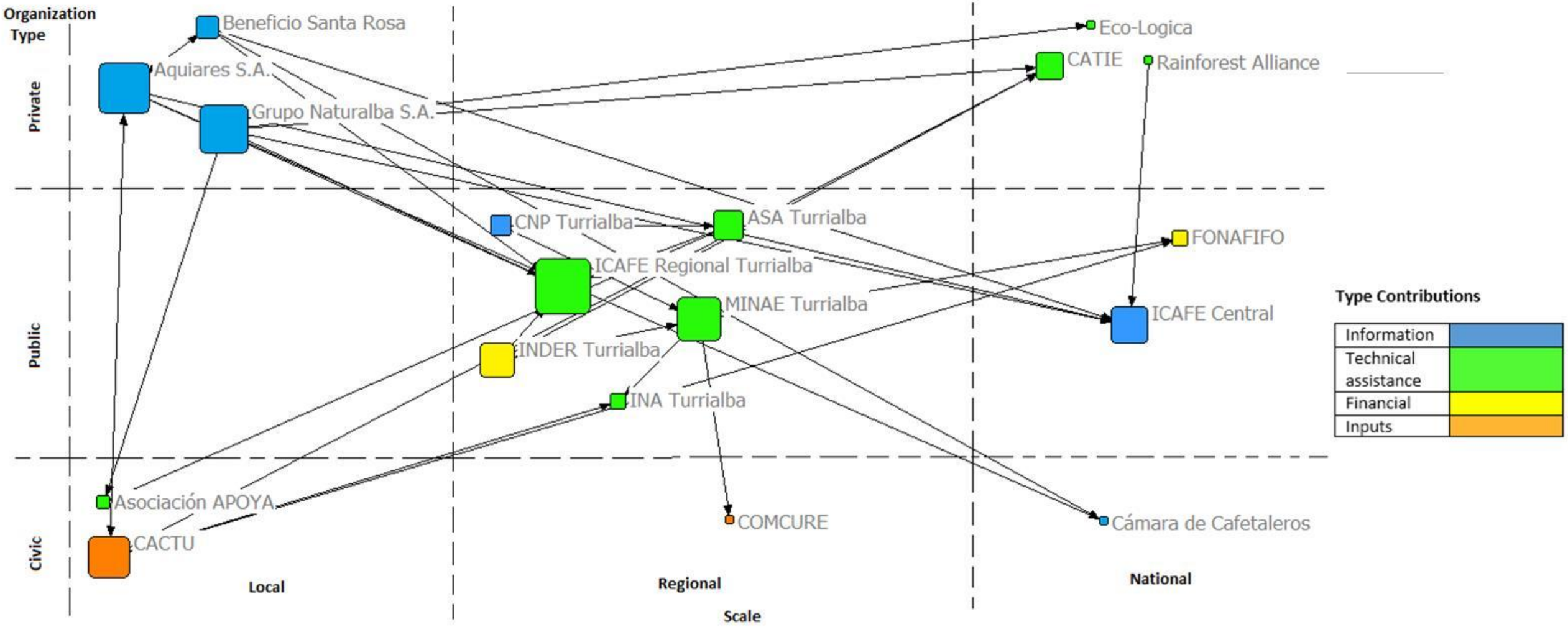
Extreme events	Adaptation benefits	Number of references	Selected references
High temperatures	short wave radiation interception	26	Barradas and Fanjul 1986 De Paiva et al. 2010; Macedo et al. 2010 Macedo et al. 2011
Hurricane	Lower erosion, and increased water infiltration	14	Hernández et al. 2002; Cannavo et al. 2011 Philpott 2008
Drought	Mulch effect reduced evaporation	8	Lin and Richards 2007 Lin 2010
Strong winds	Trees reduced wind speed	5	Caramori et al. 1995 Philpott et al. 2008

Experts' view: barriers to scaling up of EbA solutions for Coffee Smallholders



Martinez et al 2015

Cross-scale governance of coffee production in Turrialba Landscape



Private extension agencies target unorganized smallholders (the majority) and sell agrochemicals

Experimenting solutions

- Costa Rica the most advanced in public and private support to organic production (in contrast to its World primacy in agrochemical use)

- Earth markets that support the linkage between producer and consumer (e.g. the Cartago Movement local market, National Plan for Costa Rican Sustainable and Healthy Food)

- Innovation in policies (participatory certification closing the gap with extensionists from Ministry of Agriculture, organic agriculture law)

- Private Sector (Association of agri-food businesses adopting corporate social responsibility standards)

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CONTACTS:

RAFFAELE VIGNOLA, PhD

DIRECTOR

LATIN AMERICAN CHAIR OF ENVIRONMENTAL DECISIONS FOR GLOBAL CHANGE (CLADA)

CLIMATE CHANGE AND WATERSHED PROGRAM, CATIE

7170-TURRIALBA, COSTA RICA; TEL. +506-25582528

rvignola@catie.ac.cr

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